

*The Whitten Ranch—*  
**Creating More with Less**

The tiny town of Saguache, nestled at the foot of the mountains at the north end of the San Luis Valley in south central Colorado, is rich in scenery but seemingly little else. Abandoned buildings, sleepy little neighborhoods, and general untidiness create a picture that's all-too-common across the West. The sign at the town's edge reads "Gateway to the San Luis Valley". Most passers-through are happy to get through the gate and keep right on going. The town's decay mirrors that of its surrounding natural resources. It's not the sort of place where one would expect to find any lasting solutions to the complex problems that bedevil our efforts to steward the earth.

It's not the sort of place, that is, until you start talking to George Whitten. George's family has ranched and farmed on the flats immediately south of Saguache, and far up into the mountains to the west, since 1906. He is one of those rare guys possessing a combination of practical grit, extreme humility, hands-on creativity, and high-minded idealism. It's a marriage of traits that has led George down a path of discovery and learning, and to some realistically doable, holistically sound solutions to some of the world's most complex problems.

I've known about George for over ten years, but only officially met him during last summer's drought. Our short time together convinced me that I needed a follow-up visit, so I recently called to find out if I could come pick his brain for a day. George claimed he could tell me everything he knows "in about ten minutes." I pulled up to his house at nine in the morning, and by five that afternoon we hadn't stopped talking for more than about three seconds, and we could have gone on all night. I learned a lot about the crises currently facing the San Luis Valley, and about George's efforts, not only on his own land, but in his community, to tackle these issues head on. But before we get into that story, we need to have a basic understanding of the ecological, economic, and social backdrop behind life in the San Luis Valley.

### **Water Weary out West**

Perceived resource scarcity is nearly always at the root of human conflict. In the western United States, water is the resource that garners much of the attention. Farmers, ranchers, wildlife, endangered species, and western towns all vie for their fair share. So do misplaced concentrations of humanity (with their thirsty urban landscaping and water guzzling golf courses) in places like Phoenix and Las Vegas. This competition grows especially fierce during times of extended drought. As our desert cities continue their relentless sprawl, and as the water cycle across our landscapes continues to deteriorate, even "good" precipitation years will eventually seem like drought years. It's a daunting and incredibly complex issue.

The United States was founded on a couple of basic principles that make possible productive interaction between human beings, one of which is a strict prohibition against the encroachment of one person upon other persons or their property. Simply put, that just means we can't harm or steal from others. If we do, we're held accountable and we pay for it. "Water rights" constitute a very real form of property, but water is constantly flowing, evaporating, transpiring, and percolating. Its dynamic nature makes it tough to keep track of. Every action I take with my water ultimately has a consequence on every

downstream user. The action of every upstream user directly affects my ability to use my water. If I steal more than my share, or use my share in the pursuit of activities that have negative consequences for my neighbors downstream, I am encroaching on their property and affecting their ability to make a living.

When dealing with surface water rights, it's theoretically a relatively straightforward practice to divide the water up between the various users and make sure everybody is getting their fair share. It's not so simple to ensure that each water user is utilizing their resource in a benign or resource-enhancing manner, and the "division" of the water gets pretty sticky when bad drought years severely reduce surface flows. When dealing with underground aquifers, where everybody's water is connected in a big, invisible, underground lake, the size of the lake isn't well-known, the sources that recharge the lake are dimly understood, and the connection to surface flows is barely acknowledged, everything gets even way more complicated. If and how the use of my underground water is affecting your use, and whether or not that use constitutes a form of "encroachment" on your ability to make a living, are questions not easily answered.

In the San Luis Valley, all of these issues have been debated, researched, and haggled over for years. Lying at an elevation of 7000 to 8000 feet (2130 to 2440 meters), surrounded by two of the West's most dramatic mountain ranges (the San Juan and Sangre de Cristo ranges), and comprising the headwaters of the vast Rio Grande watershed, the San Luis Valley is a microcosm of everything that's "complicated" about water. At the soil surface, a whopping 7" (180 mm) of precipitation settles in an average year. Under natural conditions, most of the valley is a high altitude, very cold semi-desert with about a 90-day growing season. Beneath the soil surface, a shallow, vast underground aquifer, made possible by a unique geology and underground flows from the surrounding mountain ranges, supports a state-of-the-art agricultural industry based on center pivot sprinkler irrigation and high dollar (and high input) potato farming. Surface flows from creeks that cascade out of the mountains, and from canals diverted out of the Rio Grande itself, are the backbone of the valley's haying and cattle/sheep ranching industry.

In 2002, the valley floor received an annual deluge of 6% of its normal 7 inches (180 mm). That's .42 inches (11 mm) of total moisture, all year. The surrounding mountains finished the winter with snowpacks ranging from 10-25% of normal. So far, 2003 has been a little better, but not much – certainly not sufficient to make up for the shortfalls of 2002. As I write, snowpack is at 43% of normal and falling daily due to high winds and no new moisture. During last year's growing season, static water levels in irrigation wells dropped precipitously valley-wide, surface water flows dried up early in the season or never started flowing to begin with, artesian wells that hadn't stopped flowing since being untapped suddenly ceased production, and native range grasses on the hills skirting the valley never greened up, preventing ranchers from going to their summer ranges and forcing many to severely destock. Suddenly, the gross unsustainability of the valley's agricultural model hit everyone smack in the face.

### **Ready for Drought**

But, back on the Whitten Ranch, things were tough but not grim. George attended his first Holistic Management courses about 15 years ago, and being the practical man that he is, could immediately see lots of room for improvement on his own place, coupled

with some realistic means to get it done. Fifteen years later, he has figured out how to get by on a fraction of his former water use. He has increased the biodiversity and vigor of his irrigated meadows and hilly native rangeland to a plant mix that can thrive even in dry years. He has selected a herd of cows that can hold their condition and breed back on tight rations through fierce winters, and in dry summers when the pickin's are slim. He has cultivated his creative, inventive side and makes, builds, and fixes just about everything with salvaged scraps that most of us would throw into the junk heap. His rare purchases are generally made at a steal, opportunely nabbing "priceless" assets that others find useless. Purchases of new items are few and far between, but when they happen, they typically include things that end up paying for themselves many times over, like high-tensile electric fence wire. When the drought of 2002 hit the San Luis Valley, George was ready for it.

When you've got rights to water coming out of the ground in great natural gushes or in perennially flowing creeks and rivers, the tendency of most humans is to use it all, assuming the wetter the ground the better. For many years, when flood irrigation ruled, this was the case in the San Luis Valley. Today, all of the water is still used, but most of it is pumped through center pivot sprinklers, and very little of it reenters the aquifer. This transition from flood to sprinkler irrigation has made it possible to bring many more dryland acres under production, at least for the short term. With heavy flood irrigation, a big chunk of the water at least percolated back into the underground aquifer, so there was plenty of recharge. With the sprinklers, this vital recharge isn't happening, which is at the root of the present crisis. Under heavy flood irrigation (still in practice across much of the valley, especially on hay and pasture ground) the plant communities that developed were far from ideal. They progressed to hydrophytic, water-loving rushes and sedges. It looked good, but these plants are high in fiber and tough to digest, especially if not put up as hay while still green. They don't tap the soil's natural productive capacity either. Water-logged conditions and poor aeration result in low levels of evapotranspiration and thus photosynthesis.

George used to use all his water, but with a greater awareness of how plants grow and the ill effects of over-irrigation, now uses roughly half of his former use. Most of the irrigated ground has never been plowed or worked in any way, so is still characterized by a true mosaic of slightly undulating topography. Within a few feet, the ground can transition from a knob, to a gentle slope, to bottom ground, and then right back up to another knob. We're talking elevation differences of inches, not feet. When George floods this type of ground, he only lets the water run through the bottoms and part way up the slopes. The knobs never get inundated, but they do get water through sub-surface moisture that percolates over from the low areas.

Before, when the whole pasture was inundated for prolonged periods, the entire landscape was dominated by rushes and sedges. Now, the knobs support a very high quality species of vetch (a leguminous forb) along with a diversity of native and introduced grasses. The slopes are dominated by high quality white clover. The bottoms still contain a high concentration of Baltic rush, but also support higher quality grasses such as timothy. Overall, biological productivity has increased dramatically. On satellite images that measure plant evapotranspiration rates (which are directly correlated to photosynthetic activity) George's ranch stands out like a sore thumb. Inside George's

fence, evapotranspiration is double that of the neighbors, with roughly half the water usage.

### **Grazing Patterns**

With the exception of last year's drought, this irrigated ground (along with several hundred acres of dryland range down on the flats) has always been used for winter feed. In 2002, George elected to stay off of his summer range in the foothills southwest of Saguache. He knew the extreme drought conditions would keep his native grasses (dominated by ground-hugging, sod-forming, warm season blue grama) from recovering from their previous season's grazing, and even though the BLM (government agency that administers the public lands grazing permits throughout much of the West) gave him the green light to graze, George kept his cows home. Without his usual summer grass, severe replanning was necessary. By having to graze the flatland through the summer as well as the winter, his grazing planning indicated a need to destock 30% and buy two months worth of hay. On my visit in mid May, his plan was working out almost exactly as expected, with a little hay left over.

In most years, and starting again this year, George's typical pattern is to use the native hills for four months in the summer, beginning in mid-June and coming off in mid-October, when the cattle return to the flat country and stay clear through the winter till late spring. This winter grazing deserves some more detailed explanation. Many of the species in the irrigated areas lose much of their quality after going into dormancy. This is especially so for the courser rushes and grasses that grow in the bottom areas. The quality drops off so much that it's hard to get cattle to even eat them. The higher quality clovers and vetches also lose quality, but the bigger problem is that their more succulent form causes them to shrivel up to nothing in the dry, extreme cold of winter. To conserve this forage in a form that could be used by the cattle, George's family used to spend all summer putting up close to 30,000 small bales of hay, much of which was sold. About the time they finally finished, the cows would get home from the summer ground and they'd immediately start hauling it all back out to feed for the next 8 months.

### **Cut and Pile Hay**

Beginning about 15 years ago, George and his brother Donnie changed that whole ritual and began conserving forage quality in a much more ecologically, economically, and socially sound way. Now, the irrigated forage is left to grow throughout most of the 90-day growing season. In late August/early September, when the grasses and legumes are still green but have produced mature, viable seed, George sends out his 80+ year old dad (George Sr.) on an old windrower first thing in the morning. After George Jr. gets done with morning chores, he heads out with an old 24 foot wide dump rake pulled by a 1946 Case tractor. Driving with the rake perpendicular to the freshly cut windrows, George gathers up two rows at a time into small piles. As the rake starts to ride up over the pile, he trips the rake, the pile gets dumped, and the next pile begins to form. George Jr. (on the rake) catches up to George Sr. (on the windrower) by mid-afternoon.

The forage has to be piled when wet and green. If it's left to dry before being piled, there is a great risk that the gale force winds that sweep the valley floor could blow the whole season's crop over the Sangre de Cristos and into Kansas. The piles are loose and highly aerated, and because of the very dry, cold air, don't grow any mold inside. We

looked at the last few piles of the season, cut eight months prior, and they were still fresh and green under the weathered surface. The piles typically test 9-11 percent crude protein, which is about the same as when baled. I asked if snow cover ever made them inaccessible, and George said they seldom if ever get enough snow for that to be a problem. He actually prefers to get a nice layer of snow on the ground. The snow cover protects the piles against the intense solar radiation of their dry, high climate, and less of the forage on or near the pile's surface deteriorates in quality. George and Donnie learned about this method of forage conservation from the Deseret Ranch in Utah, where they saw cattle happily burrowing through two feet of snow to reach the piles. If they have extra cut and pile hay, they sell it as leased pasture.

The piles are rationed out with portable electric fence, with just enough piles allotted per day to meet the herds' needs. This minimizes waste, maintains a constant plane of nutrition, and keeps the cattle happy with a daily, predictable routine. If there is snow on the ground, daily rationing is even more important. As soon as the snow gets compacted around the piles, the piles get frozen in place. More than one day of trampling results in excessive snow compaction and lots of wasted forage.

Waiting till September to cut and pile, after the seed is hard and mature, has great ecological benefits. Typically, hay is put up before the seed is viable. Even if it is viable, a specific bale of hay is seldom fed exactly where it grew. Any viable seeds are therefore not necessarily dropped in the specific ecological microniche where they are most likely to germinate and grow. With cut and pile forage conservation, the forage is piled in nearly the exact location where it grew, and all those viable seeds are right where nature would have naturally deposited them. A diversity of small mammals uses the hay piles as winter cover, which in turn has drawn healthy populations of raptors.

Economically, taking into account all costs, George estimates his cost per ton of piled forage at about \$10. The cost of making hay is at least triple that, not including the machinery, fuel, and labor expense to feed it all back out again. Because it requires so much less work, and because they aren't fretting constantly about rain falling on drying windrows (which was the case back in the days of baling), the quality of life benefits are right up there with the financial and ecological benefits. George still bales a little hay, though—about 1500 70-pound bales a year. He uses this to get through the "pile to green grass transition" in May and June. Some years he doesn't need any, and if his haystack is growing, the baler and stackwagon might stay parked all summer.

### **Out on the Range**

Up on the summer range, called Tracy Canyon, which takes in about 20,000 acres (8,000 hectares) of "dry, tough old country", George has developed three permanent pastures, but strings portable fence "all over the place" to create dozens of smaller interior, temporary paddocks. He uses high ridgelines and other topographical features, along with these strategically placed portable fences, to create these smaller divisions. The temporary fences are typically wound through areas that have sufficient brush to keep the wire off the ground, so very few posts are needed. Generally, he plans to vary the timing of grazing so that each patch of ground gets grazed at different points in the growing season in successive years. Most areas will only receive one grazing per year, but sometimes exceptional moisture will generate enough recovery that the cattle can return to some spots for a second grazing. Lots of effort has been put into developing

water points. Small springs at the tops of drainages (the largest produces only 1.3 gallons per minute) are plumbed together with 1.5 inch black poly pipe to create water flows capable of watering the 200+ head herd.

George admits that after fifteen years of careful grazing planning on the Tracy, grass species diversity hasn't appreciably improved, but there has been a great influx of valuable shrubs such as saltbush and winterfat. Cottonwood trees have also begun to make a comeback along riparian areas. Because he has minimized overgrazing of existing plants so effectively, those plants do show an increase in vigor. But George isn't sure if the grass community will ever really take off as long as "every year grazing" during the growing season continues. George feels plants in this low production, highly brittle country need the chance to periodically grow through an entire growing season without being grazed, allowing them to build roots and accumulate significant above-ground material that can add to the litter bank. By grazing/impacting every year, even under well-timed, well-planned grazing, it's tough for either of these things to happen. With new pipelines and water points developed this spring, George has opened up lots more country that previously was poorly utilized by cattle. He plans to use those areas (which are suffering from too much rest, or overrest) more heavily in the near term, enabling the planning of longer recovery periods on much of his historically more frequently grazed country.

When he was growing up, the Whittens were sheep ranchers, and they used the Tracy for winter sheep grazing. George remembers knee high blue gramma blowing in the wind way back when he was little. The sheep would willingly graze right to the ridges, and as long as there was a little snow on the ground, the sheep didn't need any other source of water. This well-distributed dormant season grazing and impacting (on predominantly warm season grasses) might be what the country is truly adapted to. This is likely the sort of country the wild bighorn sheep migrated to in the winter, after summering in the alpine tundra of the adjacent mountains. George has approached the BLM about a return to dormant season use with sheep, but because it is "potential" bighorn habitat (the closest actual bighorns are fifteen miles away), and because domestic sheep diseases are so easily transferred to wild sheep, that's temporarily out of the question.

### **Local Water Challenges**

George has figured out how to make his own country work, but he's intimately connected to all of his neighbors via their common water resource. Because of the way his neighbors are managing their water, sustainable production of high quality forage and beef on the Whittens is under grave threat. Saguache Creek runs down through or near most of the Whitten Ranch, and historically they've relied on its flow during the growing season to irrigate roughly half of their flat country. The other half is watered by wells. For the past two years, no water has made it far enough down Saguache Creek to use for irrigation. The same goes for many of George's neighbors. A massive haying operation, North Star Farm (formerly South Farm) just south of Saguache, is the likely culprit. Thirty four center pivot sprinklers pull water from the aquifer that obviously is directly tied to Saguache Creek. Last summer, for the first time ever, the static water level in the ranch's ultra-reliable irrigation wells dropped down so low that the pumps started to surge. George had to spend several thousand dollars to drop the pumps. A form of

encroachment on another's property? Absolutely. But how can it be proven, tracked, quantified?

George got to thinking. When South Farm's center pivots shut down in the fall, Saguache Creek starts to run again, and it runs all winter. George figured that if only that winter flow could somehow be used to build up the aquifer during the non-growing season, they could quantify that rise in the water table, and would then be entitled to its use the following growing season. But in Colorado, surface flow rights are only valid during the growing season. If water is trapped in a reservoir during the winter, or diverted into a gravel pit to run back into the aquifer, or even run out on the ground and stored as ice, it's a different use of the water. Now it's "storage water", and that use has to be filed on.

George thought he had the answer, but his neighbors all balked at the idea of filing on water that they already assumed was theirs. After months of futile attempts to convince his neighbors that winter flows were indeed *not* theirs for the taking, George took desperate measures and filed on most of the water himself. Suddenly he got everyone's attention. To make a long story short, now the ranchers along Saguache Creek are working together to get some of this winter flow back into the ground via diversion into large gravel pits. If they can measure a rise in the water table as a result, that water will legally be theirs during the growing season. North Star Farm would not be able to use it, thus ensuring the aquifer would not be pumped dry. Hopefully, with a higher water table, Saguache Creek would also provide surface flows longer into the growing season, and potentially all season. It's a grand and complicated scheme, but George is convinced it just might work. As the vice president of the Rio Grande Water Conservation District, much of George's life is spent deliberating and planning grand water schemes too numerous and complex to even begin to explain.

### **Tough Country, Tough Critters**

Wintertime temperatures in the San Luis Valley are among the coldest in the nation. Mid-winter lows can drop to -20 to -30 F (-30 to -35 C) for weeks at a time. Strong, whipping winds amplify the extreme cold even further. On my visit in mid-May, cool season grasses were just barely beginning to show a little green. The high altitude can cause pulmonary hypertension (commonly called brisket disease) in cattle, which are more adapted to lower elevation grasslands. The sparse, erratic, unpredictable precipitation creates a sparse forage resource on the native ranges, and on the valley floor, high soil alkalinity and Molybdenum excesses can create bovine metabolic disorders. Despite the abundant ground water and dramatic scenery, the San Luis Valley is a long ways from paradise, and it takes one heck of a tough cow to make a living here.

George's selection criteria are pretty straightforward and practical—if a cow can hold enough condition to breed back every year, she's got a home. That's it. Longer legged, bigger framed cows have a tougher time pulling that off than moderate framed, deep bodied animals. When George was forced into selling 30% of his herd last year, he saw it as a prime opportunity to send a good chunk of his least-desired gene pool down the road.

Calves are weaned in mid-November, steers are sold in December and cull heifers go off the place in January. He weans with a four-strand electric fence, with mammas on one side and youngsters on the other. Replacement heifers stay out of the herd for about a

month at weaning, then go back in with everybody else and never come out again. That places them under strict selection pressure, and George insists a heifer learns to be a lot better cow if she grows up with her older relatives. He holds back about 20 percent of his heifer crop each year, and by the time they're two, only about half have survived in the herd. Considering the tough environmental constraints and no-nonsense culling policy, that's a pretty low replacement rate.

The herd started out as straight Herefords, just like nearly every cow herd across Colorado. In the '70s, a switch to Angus bulls added hybrid vigor and black hides. In the mid '80s, George started crossing his black baldy cows to Tarentaise bulls, a high altitude, very fertile, very tough dual purpose breed from the French Alps, sourcing them from Doc and Connie Hatfield's herd on the cold steppe of eastern Oregon. That put a little more milk and hardiness in them, but George was getting concerned that they were getting a little too milky for his tough country. For the past several years, he's been sourcing bulls from Kit Pharo. Out on the short grass prairie of eastern Colorado, Kit runs his cows tougher than most commercial cattlemen. He offers a line of small to moderate framed forage tested bulls, mostly of English breeding. George showed me his newest purchase—a thick, meaty, short-legged, deep bodied two-year old black baldy bull. He wasn't anything like what you'd find at 99.9 percent of bull sales across the country, but he looked like a grass conversion, profit-making machine.

### **The George and Julie Love Story**

That's the water, grass, and cow side to this story, but the people side is equally inspiring. In the fall of 2000, George found himself in the middle of building a new house, but with no partner to share it with. One of his best buddies told him that his potential mate was unlikely to come driving up his driveway; he had to get out and look a little. Turned out that a search wasn't necessary, because that mate, Julie Sullivan, pulled through the ranch gate without any prodding. Julie has had a remarkable career as a very unconventional college professor. For ten years, she taught full time with the Audubon Expeditionary Institute, which offers undergraduate and graduate degrees in environmental studies and environmental education (accredited by Lesley University of Cambridge, Mass.).

For an entire semester, 15-20 students and 2-3 faculty travel hundreds to thousands of miles by school bus and sleep in tents. Each semester trip focuses on a particular geographic region of the country, and students explore every aspect of the ecological, social, and economic issues of their specific region. The Audubon Institute faculty caught wind of this George Whitten guy out at the headwaters of the Rio Grande, and thought he'd probably be an interesting character to look up. It didn't take long for George and Julie to realize they'd been looking for each other for a long time, and by July of 2001 they were married. Julie remains associated with the college, and they have plans to develop a semester course that will be based out of the Whitten Ranch.

George and Julie have a contagious enthusiasm and inspiring vision, and for good reason. They're living their lives fully, consciously, and deliberately toward their deepest human values. They are in harmony with their soils and plants, their water, their animals, their wildlife, and their community. They are free of debt and, due to George's self-sufficient, penny-pinching habits, the ranch has always turned a profit. They humbly envision themselves as catalysts for change in the human race's transition to a more



holistically-grounded culture. Julie is passionate about erasing the “false polarity” that blocks constructive dialogue between well-meaning environmentalists and direct users of the land, between the urban masses and the rural minority. There is no polarity—we are all humans with the same essential needs living in the same ecosystem. As George puts it, “We came to America as Europeans, and we’re managing our resources like we’re still in Europe. We can’t make Europe out of this cold desert. We need to learn to be Americans.” Well said, George. Thanks again for taking the day off to show me around.